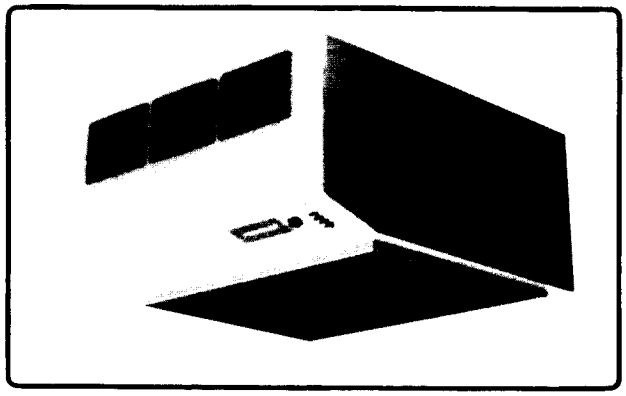
SMOKEMASTER®

OWNER AND TECHNICAL MANUAL



SMOKEMASTER® MODEL C-12 SELF-CONTAINED ELECTRONIC AIR CLEANER

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MADE WITH PRIDE IN THE U.S.A.

OWNER MANUAL
SMOKEMASTER PART 1

Your Smokemaster Electronic Air Cleaner is an advanced self-contained electronic air cleaner. The Model C-12 is an efficient indoor pollution fighter while reducing costly energy consumption.

CLEAN AIR

A clean fresh atmosphere is a plus to any business. With your new Smokemaster Electronic Air Cleaner, your customers and employees can now breathe air that is relatively free of smoke, dust or pollen. This is especially important with regard to today's concern with the effects of smokers upon non-smokers and also for a more comfortable environment for allergy sufferers.

LOWER ENERGY CONSUMPTION

A common solution to the problem of dense concentrations of smoke is to exhaust. Excessive exhausting is wasteful and very expensive. One is exhausting expensively heated or cooled air and needing to heat and cool the outdoor air coming in. A Smokemaster C-12 drastically reduces the need for outside air. This means you can save as much as 40 percent on heating and cooling bills!

REDECORATING

Smoke particles also have a tendency to settle out as a dulling film on mirrors, windows, trophies, bottles and glassware. In fact, most of the particles which produce soiling and staining are just too small to be removed by average dusting. Electronic air cleaning gets rid of these particles before they have a chance to start the soiling process. Less soiling means longer periods between redecorating. If the appearance of your business is important to you, electronic air cleaning is certainly a plus.

EXTRA COMFORT AND SAVINGS

The effective air pattern of the Model C-12 creates a more comfortable atmosphere by constant slight air movement. This slight movement, while more comfortable, also helps to eliminate existing drafts. Another side benefit of the air recirculation pattern is that it distributes the heated or cooled air more evenly. This even distribution helps to reduce the amount of heated or cooled air needed for the same degree of warmth or cool.

LOW OPERATING COST

In addition to reduced heating-cooling bills and redecorating bills, the relatively low cost of maintaining an electronic air cleaner is another financial boost to your business. This air cleaner has no throwaway filter or other parts that must be periodically replaced. The durable electronic cells and prefilter screens are washed and used over and over again. No replacement parts means reduced maintenance cost.

COMPONENTS

COMPONENTS OF THE C-12 ELECTRONIC AIR CLEANER

Cabinet & Grille

Low profile design and finish options assure decor compatibility while also made of durable steel. Intake grille adds to the compatible appearance.

Removable Prefilters

Metal mesh prefilters catch larger particles before entering the electronic cells.

System Indicator Lamp, Power Pack and Three Speed Control

The System Lamp monitors the electrical output automatically indicating any system malfunction. The power supply is located behind the bolted door with the system indicator light. The three-speed control is accessible and is convenient to alter fan speed for varying concentrations of contaminants.

Electronic Cells

Heavy Duty Cells remove easily with attache grip handles. Lightweight (9½ lbs.) and durable, each cell fits easily in the dishwasher or conventional container to remove trapped particles accumulated from cleaning dirty air.

Hinged Access Door

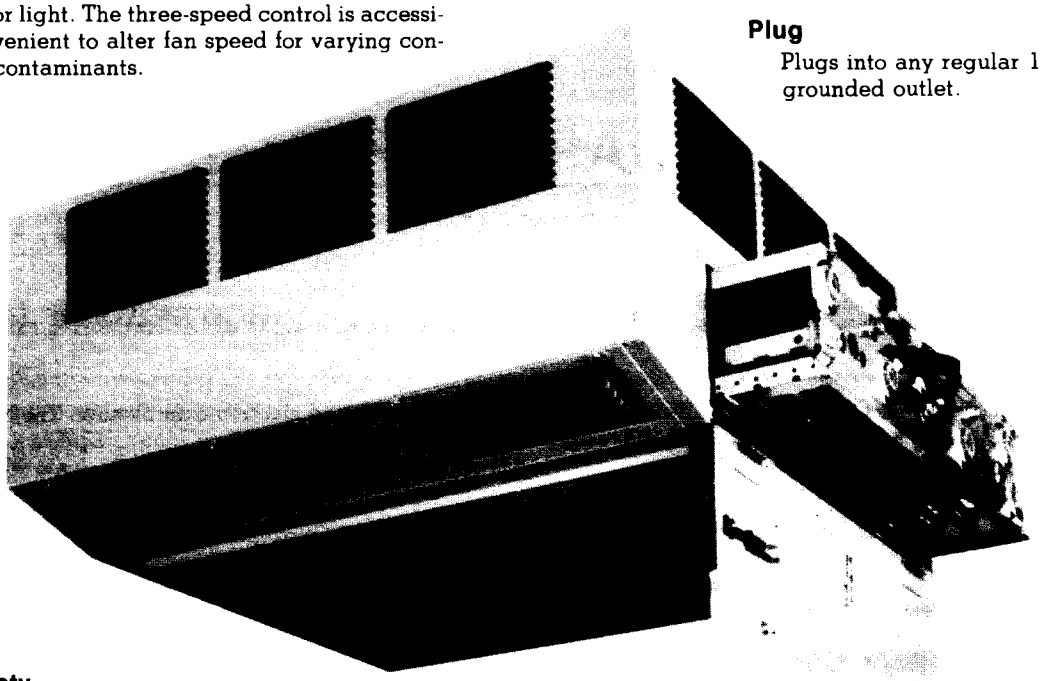
Allows easy access to components for periodic cell and prefilter cleaning. Safety interlock discharges all power when door is opened. Built-in test button assures collector performance.

Mounting

Mounts on wall brackets or with steel suspension rods. For mounting directly to a joist ceiling, lag screws are available.

Plug

Plugs into any regular 120 volt grounded outlet.



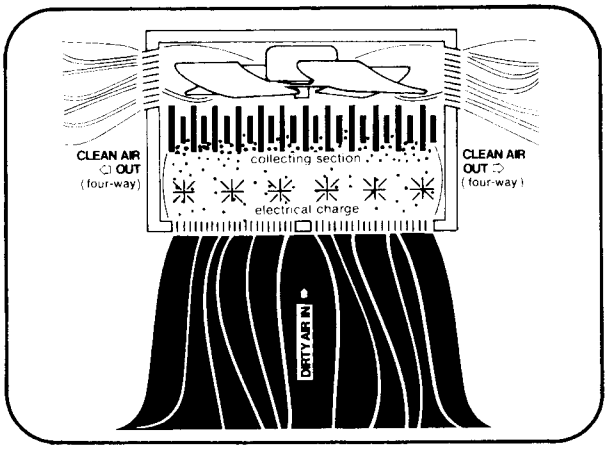
For Your Safety

U.L. Listed
(60 Hz. units only)

PRINCIPLES OF OPERATION

HOW YOUR ELECTRONIC AIR CLEANER WORKS

Airborne contaminants are trapped by a process called "Electrostatic Precipitation." The diagram below simplifies the construction of the Smokemaster Electronic Air Cleaner. Particles are first given a strong electrical charge in the charging section of each cell. These charged particles are then attracted to and held by the collection section of each cell and held there until cleansed at regular intervals. The Smokemaster C-12 has its own fan which circulates the air through the unit.



OPERATING INSTRUCTIONS

FAN SWITCH

Your electronic air cleaner has an Off-Low-Med-Hi switch. The electronic air cleaner and built-in fan are designed to run simultaneously. Turn Off the air cleaner before opening the access door to remove the electronic cells for cleaning.

SYSTEM LIGHT

Your electronic air cleaner is equipped to tell you simply and quickly that it is working properly. The amber system light tells at a glance the status of the power supply. The system light should be on when the unit is on.

TEST BUTTON

Pushing the red test button located on the cell door (on the side of the unit), tells you whether the collector is working. A snapping sound indicates that the collector is working properly.

MAINTENANCE

WASHING THE ELECTRONIC CELLS AND PREFILTER SCREENS

To maintain peak efficiency, the electronic cells and prefilter screens in your electronic air cleaner must be washed regularly. The washing is necessary to remove dirt particles collected from the air. Check with your Smokemaster representative to determine how often your cells need to be washed for your particular application. Intake grille may be removed from machine for periodic washing.

WARNING: Electronic cell is a delicate instrument and should be handled accordingly. Warranty covers manufacturer's defects only. Smokemaster Inc. assumes no responsibility for misused or damaged cells due to improper handling or maintenance.

CAUTION:

Use care when handling the electronic cells. The metal edges can be sharp. Also be careful not to damage cells by dropping, bumping against furniture, etc. Do not splash detergent solution in eyes, and avoid prolonged contact with skin. Keep detergent out of children's reach.

OPTION 1 - Manual Washing/Smokemaster Liquid Cell Cleaner

1. Pour CLEANER into a container nearly the size of the cell. Cleaner and containers are available from your SMOKEMASTER dealer.
2. Immerse cell in CLEANER and remove immediately. Set cell aside for 5-7 minutes.

   Note: If detergent is allowed to dry on cell, repeat above procedure.
3. Thoroughly pressure rinse cell with very hot water. Rinsing is most critical. If cell is not completely rinsed, or if water is not very hot, cell will not be clean and procedure must be repeated.
4. Allow cell to dry.
5. Replace cell in air cleaner.
6. Replace cleaning solution when cells are no longer being effectively cleaned.

CELL CLEANER IS REUSABLE. SAVE FOR REPEATED USE.

OPTION 2 - Manual Washing/Commercial Detergent

The electronic cell may be washed manually by soaking it in a solution of commercial grade detergent.

1. Provide a suitable container, large enough to hold the cells. A large plastic dishpan or laundry tub works well.
2. Select a commercial grade detergent that dissolves readily in hot water. Depending on local water conditions, some brands may form a precipitate or scum. If a noticeable scum floats to the surface, try another brand. Special electronic cell detergent is available from your Smokemaster representative.
3. Before placing cells in wash container, pour in detergent. Use approximately ¾ cup per cell if container is about the size of cells. Use proportionately more if container is larger. Add enough **very hot** water to cover the cells.
4. After the detergent has completely dissolved, place the electronic cells in the container.
5. Soak the cells for approximately 30 minutes, slosh several times and remove.
6. Rinse the cells well with very hot water. It is important that all of the detergent is rinsed off.
7. Inspect collector plates for cleanliness. Repeat wash procedure if necessary. Check the electronic cells for broken wires and bent collector plates. The cells may be installed in the air cleaner and energized. The indicator light may remain off during the normal two hour drying time. However, if annoying arcing occurs during this period, the cell may be removed to dry.

OPTION 3 - Automatic Dishwasher

Electronic cells and prefilters can be washed in an automatic dishwasher. Make sure that the airflow arrows on electronic cells point up. Also be careful not to damage cells by bending plates or breaking ionizer wires on dishwasher rack. The cells may require more frequent washing if automatic dishwasher is used.

Cleaning Prefilters

Remove lint from prefilter screens with vacuum or wash in a dishwasher or commercial detergent solution. Do not wash screens in Smokemaster cell cleaner. If screens are washed in same commercial solution as cells, make sure they are washed after the electronic cells.

TECHNICAL MANUAL
SMOKEMASTER PART 2

THE C-12 IS A SELF-CONTAINED ELECTRONIC AIR CLEANER FOR USE IN COMMERCIAL AND LIGHT INDUSTRIAL APPLICATIONS. THE AIR CLEANER IS MOUNTED IN THE ROOM OR AREA WHERE THE AIR IS TO BE CLEANED. A THREE-SPEED FAN CIRCULATES AIR THROUGH A METAL MESH PREFILTER AND AN ELECTRONIC CELL. IT REMOVES AIRBORNE PARTICLES SUCH AS DUST, SOOT, POLLEN, AND TOBACCO SMOKE FROM THE AIR.

- Three-speed fan circulates up to 1250 cubic feet per minute (2124 M^3/h).
- Self-regulating power supply output is not affected by moderate fluctuations in line voltage.
- Interlock switches prevent operation when access door is open.
- 120V, 60 Hz or 220/240V, 50 Hz models available.
- Powered from a standard grounded electrical outlet.
- Electronic cells easily removed for cleaning.

SPECIFICATIONS

MODEL: **C-12** includes 2 electronic cells and a 3-speed fan. Discharges air in four directions parallel to ceiling upon which it is mounted.

POWER CORD: 10 feet (3 meters) long, 3 wires – 3-prong plug included with 120V, 60 Hz models. On 220/240V, 50 Hz models, plug must be purchased locally.

AMBIENT TEMPERATURE RATING:
Shipping and Storage minus 40 to 150 F [minus 40 to plus 65.5 C]

EFFICIENCY: Up to 94 percent efficiency is deivered as measured according to the national Bureau of Standards Dust Spot Method using atmospheric dust, and American Society of Heating, Refrigerating, and Air-Conditioning Engineers Standard 52-76.

CAPACITY:

FAN	60 HZ			50 HZ[a]		
SPEED	CFM	M^3/h	EFF	CFM	M^3/h	EFF
High	1250	2124	89	1025	1740	90
Medium	1050	1780	90	900	1530	91
Low	800	1360	93	775	1320	94

[a]At 230V, 50 Hz.

ELECTRICAL RATINGS:
Voltage and Frequency–120V ac, 60 Hz; 220/240V ac, 50 Hz.
Current and Power Consumption–

	60 HZ		50 HZ[a]	
FAN SPEED	WATT	AMP	WATT	AMP
High	270	3.3	300	1.8
Medium	230	2.7	250	1.5
Low	200	2.4	220	1.3

[a]At 230V, 50 Hz.

WEIGHT: 79 lbs. [36 kg] shipping, 69 lbs. [31 kg] installed, including electronic cells. Each cell weighs 9-1/2 lbs. [4.3 kg].

DIMENSIONS: 25 x 25 x 11 inches [635 mm x 635 mm x 279.5 mm].

ACCESSORIES:

Wash Kit

Cell Washing container with cover. Part no. 30182

Cell Cleaner Concentrate

Dilutes 4 to one. Stores in above wash container. Part no. 45008

Wall Mounting Kit

Two wall mounting brackets with air cleaner mounting bolts attached. One blank plate covers louvers on the wall side of air cleaner. Part no. 07006.

Lag Screw Kit

Four 8 inch screws and washers for mounting of air cleaner to joist ceilings. Part no. 05053.

UNDERWRITERS LABORATORIES INC. LISTED:

File No. E55711

Guide No. AGGZ (60 Hz. units only)

CANADIAN STANDARDS LISTED:
File No. LR89416-1

GENERAL INFORMATION

APPLICATION

The **C-12** is mounted in the room or area where the air is to be cleaned. It is especially suited for service in buildings or rooms where existing air circulation is limited, or where installation of a central system air cleaner would be impractical.

One very common application for the **C12** is the removal of smoke from the air in bars, lounges, restaurants, and bowling alleys. It is also used in a variety of other applications such as welding shops, kitchens, and club rooms.

Because it provides its own air circulation, the **C12** may be used in almost any application requiring the removal of airborne particulate contamination from an enclosed space.

It cannot, however, be used in any area where combustible gases or vapors are likely to be present in the air.

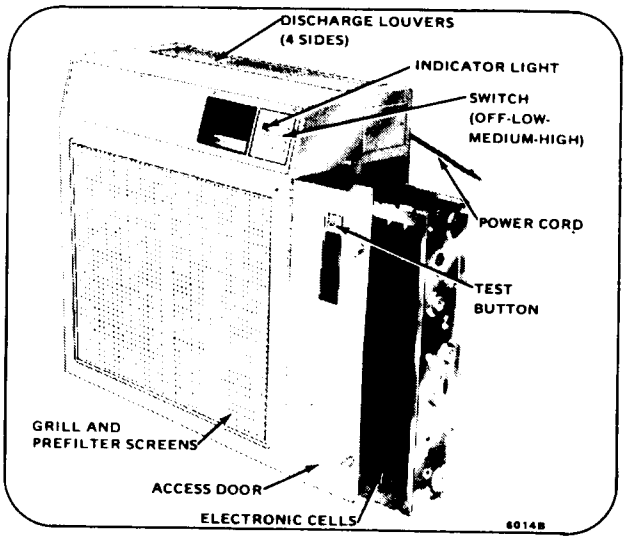


FIG. 1– C12 COMPONENTS.

GENERAL INFORMATION - Continued

MAKE-UP AIR

Recommended quantities of clean outdoor ventilation air for various applications are described in Table 2 of the ASHRAE Standard 62-89 "Ventilation for Acceptable Indoor Air Quality." ASHRAE (American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc., Phone #404-636-8400) notes that these recommended outdoor air quantities may be reduced by the use of clean, recirculated air if the IAQ Procedure 6.2 is used Appendix E of ASHRAE 62-89 includes recommendations for the use of clean recirculated air. However, in most cases, adequate control of carbon dioxide generally requires a minimum clean outdoor air quantity of no less than 15 cubic feet of air per minute per person.

Additional ventilation may be required for toxic contaminants. In any event, the air cleaner must be used only in areas which are ventilated for human occupancy in order to disipate any incidental generation of ozone.

SIZING

Electronic air cleaners are generally best sized according to the use of the area and the volume of the room (Air Changes per Hour Method).

Secondary factors to consider in applying electronic air cleaners include:
-type of contamination
-number of occupants
-outside air quality
-anticipated fan setting
-rate of contaminate generation

By considering these factors, the number of air cleaners required can be adjusted up or down to account for abnormalities in operating conditions.

Follow Steps 1 through 4 to determine the number of air cleaners required:

Step 1 - Measure the length, width, and height of the room in feet.
Step 2 - Determine the Air Changes per Hour required. See Chart A below.
Step 3 - Determine the C.F.M. (Cubic Feet per Minute of Air). See Chart B below.
Step 4 - Plug the figures from Steps 1-3 into the sizing formula below and calculate the number of air cleaners required.

CHART A - AIR CHANGES PER HOUR

Load	Description of Application	Air Changes
Light	General offices & computer rooms	4-5
Average	Conference and break rooms	6
Heavy	Designated smoking areas, bingo halls, bars, & extra smoky areas	8-10

CHART B - CUBIC FEET OF AIR PER MINUTE

The air cleaner has a three-speed fan motor. Use the C.F.M. that corresponds to the speed that the air cleaner will operate on normally. Low speed where noise is a prime concern and high speed where noise is not a factor.

Model C-12	Low	Medium	High
C.F.M.	800	1050	1250
Noise Level	57.5 dB(A)	65 dB(A)	69 dB(A)

SIZING FORMULA

$$\frac{\text{L x W x H of Room x Air Changes / Hr.}}{\text{C.F.M. of Air (see Chart B) x 60 Min.}} = \text{\# of C-12's}$$

NOTE: The maintenance interval for cell cleaning can be lengthened by increasing the number of air cleaners beyond the required number.

INSTALLATION

CAUTION

1. Installer must be a trained, experienced serviceman.
2. Disconnect power supply before installation to prevent electrical shock and equipment damage.
3. All wiring must comply with applicable codes and ordinances.
4. Do not exceed the ratings given in the SPECIFICATIONS section.
5. Always conduct a thorough checkout when installation is complete.

LOCATION

The C-12 should be mounted on the ceiling near the center of the room. Air is drawn into the bottom of the C-12 and discharged in 4 directions. Divide larger rooms into sections and use an C-12 in the center of each section (Fig. 2).

The C-12 should be installed at the ceiling in nearly all applications. This is especially important when the air cleaner is used for smoke control. Visible smoke contains very small particles–so small, in fact, that they are not noticeably affected by gravity. Smoke usually rises to the ceiling and hangs there.

If the C-12 must be installed some distance away from the ceiling, make sure it is at least 14 inches [355 mm] away from the ceiling. This measure is necessary to reduce staining of the ceiling of lingering smoky air. When the air cleaner is right against the ceiling, the air at the ceiling is moving too fast to deposit dirt particles. Over 14 inches [355 mm] from the ceiling, the effect is not a problem. But in the space between, slow moving, dirty air is drawn into the area of the discharge outlets and can stain a light colored ceiling.

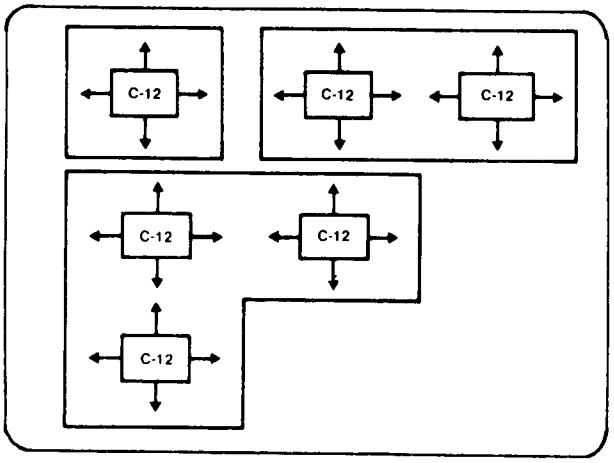


FIG. 2–MOUNT THE C-12 ON THE CEILING AT THE CENTER OF THE AREA TO BE CLEANED.

Check the existing air circulation in the room. The C-12 should be installed so that it aids the circulation already established. When airflow patterns are not immediately apparent, observe the smoke from a cigarette in various locations within the room.

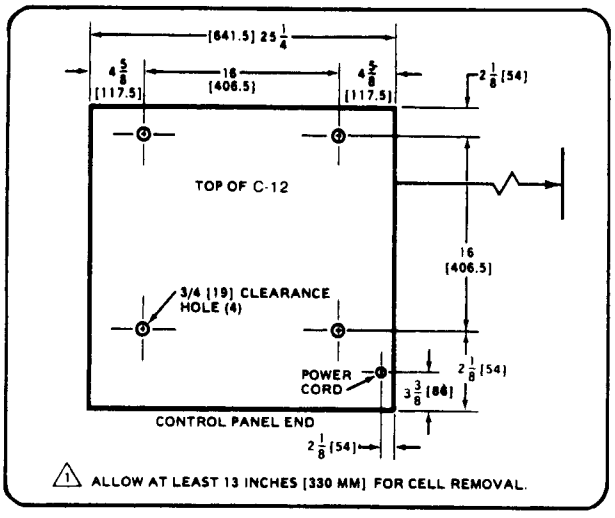


FIG. 3–APPROXIMATE INSTALLATION DIMENSIONS IN INCHES (MILLIMETERS IN BRACKETS.

CEILING MOUNTING

The C-12 is mounted by suspending it from the ceiling.

The mounting holes in the C-12 are spaced 16 inches (406.5 mm) between centers in both directions. This makes it easy to fasten the air cleaner directly to the ceiling framework with 8 inch lag screws. Leave space for the power cord to run between the top of C-12 and ceiling. The power supply cord must not be concealed above ceilings or behind walls.

Note in Fig. 4 that the air cleaner is not suspended from the top but rather from the venturi plate, which is heavier metal and designed to support the entire device.

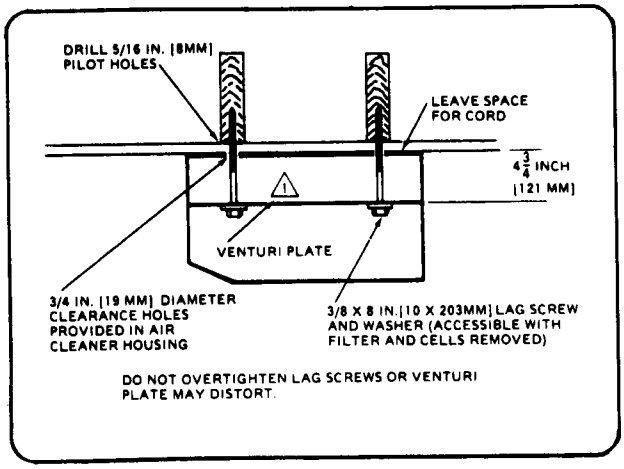

DRILL 5/16 IN. [8MM] PILOT HOLES
LEAVE SPACE FOR CORD
4 3/4 INCH [121 MM]
VENTURI PLATE
3/4 IN. [19 MM] DIAMETER CLEARANCE HOLES PROVIDED IN AIR CLEANER HOUSING
3/8 X 8 IN. [10 X 203MM] LAG SCREW AND WASHER (ACCESSIBLE WITH FILTER AND CELLS REMOVED)
DO NOT OVERTIGHTEN LAG SCREWS OR VENTURI PLATE MAY DISTORT.

FIG. 4—USE FOUR 3/8 X 8 INCH LAG SCREWS AND WASHERS TO FASTEN THE C-12 TO THE CEILING FRAME.

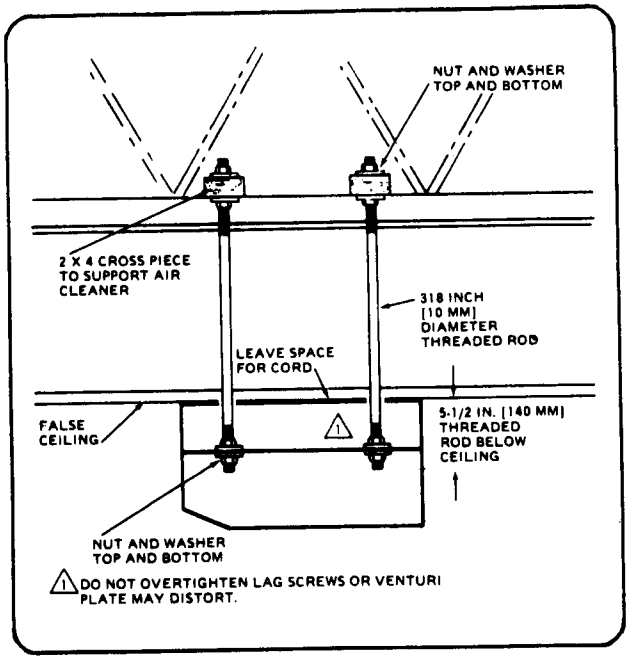

NUT AND WASHER TOP AND BOTTOM
2 X 4 CROSS PIECE TO SUPPORT AIR CLEANER
3/8 INCH [10 MM] DIAMETER THREADED ROD
LEAVE SPACE FOR CORD
FALSE CEILING
5-1/2 IN. [140 MM] THREADED ROD BELOW CEILING
NUT AND WASHER TOP AND BOTTOM
DO NOT OVERTIGHTEN LAG SCREWS OR VENTURI PLATE MAY DISTORT.

FIG. 5–HANG THE C-12 FROM THE THREADED STEEL RODS WHICH BOLT TO THE VENTURI PLATE.

Be sure that you select a strong structural part of the ceiling. Do not fasten it to a false ceiling or to plaster or plasterboard. In some cases, it may be necessary to construct some type of framing strong enough to support the weight of the C-12.

The C-12 may also be mounted using 3/8 in. [10 mm] diameter threaded steel rods available in many hardware stores. Four steel rods will be required.

WALL MOUNTING

Two wall mounting brackets are used to support the C-12. They are included in an accessory package along with a blank plate to block off the outlet louvers on the side of the air cleaner which will be against the wall.

The 2 brackets must be mounted on the wall 16 inches [406.5 mm] between centers so that the long bolts will line up with the air cleaner mounting holes. The brackets should be securely fastened to the wall studs with lag screws. On masonry walls, use appropriate screw anchors.

Use the blank metal plate to block off the louvered outlet on the side of the air cleaner that will face the wall. Use the 2 screws with nuts and washers to fasten this plate to the louvers.

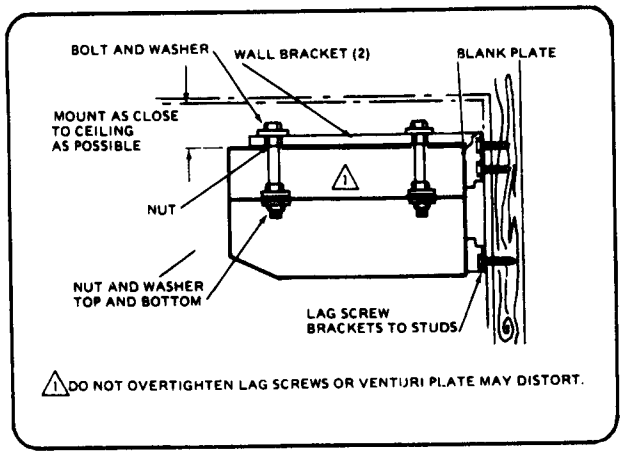

BOLT AND WASHER
WALL BRACKET (2)
BLANK PLATE
MOUNT AS CLOSE TO CEILING AS POSSIBLE
NUT
NUT AND WASHER TOP AND BOTTOM
LAG SCREW BRACKETS TO STUDS
DO NOT OVERTIGHTEN LAG SCREWS OR VENTURI PLATE MAY DISTORT.

FIG. 6—USE ACCESSORY MOUNTING BRACKETS TO MOUNT C-12 ON WALL.

WIRING

The 120V, 60 Hz C-12 has a standard 3-prong plug on a 10 foot [3 m] power cord. It requires only a standard grounded outlet for electrical power. On the 220/240V, 50 Hz models, add a 3-prong plug (purchased locally) to the power cord.

The power source must be 120 volt, 60 Hz or 220/240V, 50 Hz depending on model.

Route the power cord so that it will be out of the way of the building's occupants.

PERMANENT WIRING

To permanently wire the C-12 follow these instructions exactly. All wiring must comply with applicable codes and ordinances. Wire the C-12 using the built-in junction box as indicated in fig.7. The power source must be 120 volt, 60 Hz.

It is recommended that No. 14 or heavier wire be used to complete the wiring from the junction box to the external power source. However, be sure to comply with local codes.

1. Open C-12 junction box cover (Fig.7).
2. Disconnect and discard the power cord, the solderless connectors and strain relief. Plug the power cord hole with the plug provided.
3. Run conduit from power supply to junction box through the appropriate knockout. Fish wires to junction box.
4. Connect lead wires with solderless connectors including ground (green) wires. Proper grounding of this device is mandatory for correct operation and safety.
5. Insert hole plug in hole where power cord was removed.

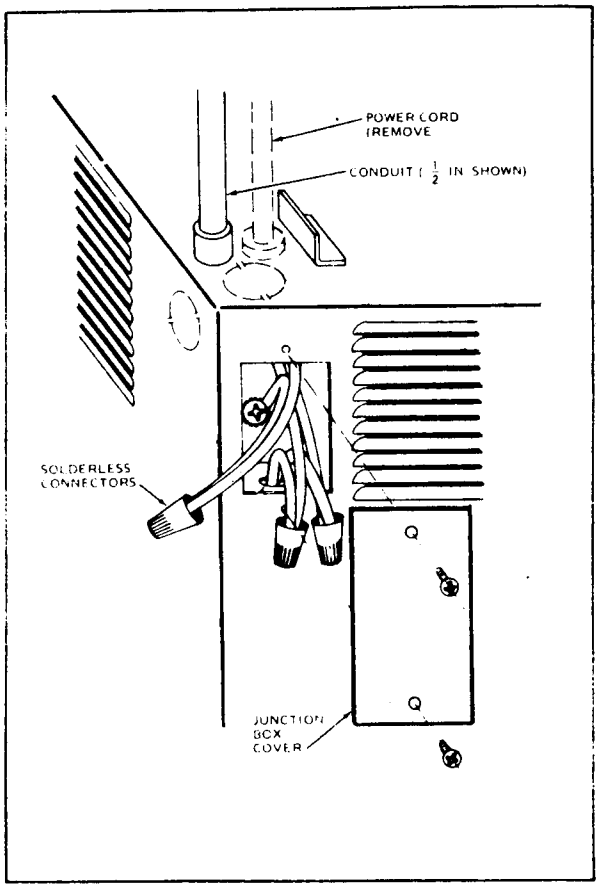


FIG. 7–REMOVE THE JUNCTION BOX COVER TO GAIN ACCESS TO THE POWER SUPPLY CONNECTIONS.

CHECKOUT

Before leaving the installation, check to be sure that the C-12 is properly installed and operates correctly.

MOUNTING

- ☐ The C-12 is securely fastened to the ceiling or wall.
- ☐ It is mounted where it *will not* interfere with normal occupant traffic.
- ☐ Unit is properly oriented for good air circulation.

ASSEMBLY

- ☐ Electronic cells are correctly oriented–airflow arrows pointing toward blower.
- ☐ Prefilter screens properly installed.

OPERATION

- ☐ Fan runs correctly in all speed settings.
- ☐ SYSTEM light turns on when fan is running.
- ☐ Opening access door stops fan and turns out the system light.

NOTE: If the C-12 does not appear to work right, refer to ELECTRICAL TROUBLESHOOTING.

CLEANUP

- ☐ Clean the outside surfaces of the air cleaner.
- ☐ Clean up the installation area.

SERVICE

WARNING

The following instructions are intended for qualified service personnel only. Dangerous line voltage circuits are exposed during this procedure. Disconnect power before servicing unit.

MOTOR REPLACEMENT PROCEDURE

1. Disconnect power from unit.
2. Open cell access door. Remove cells, prefilters, and grille to provide access to motor.
3. Remove fan blade from motor.
4. Disconnect fan motor leads at disconnect near motor (or at terminal block on earlier units).
5. Remove 4 screws holding motor and bracket to unit.
6. On earlier units it will be necessary to install a bracket (included in motor replacement kit) in place of the cable clamp. Plug the electrical connector into this bracket and route the wires to the terminal block.
7. Install new motor and bracket, connect electrical lines and replace fan, grille, prefilters and cells.
8. Connect power and check new motor operation.

POWER SUPPLY REPLACEMENT PROCEDURE

1. Disconnect power from unit.
2. Disconnect quick connect terminals from power supply. Unplug power supply wire harness.
3. Remove 4 screws holding power supply in place. (On earlier units, remove nuts and washers from inside of cabinets.)
4. Install new power supply.
5. Connect line voltage wires to power supply with plugs. **Wires with similar colors go together.** Next, connect the pink high voltage wires to the outside terminals on the contact board which are marked I. Attach the grey high voltage wires to the inside terminals marked C. Be certain that all wires are connected properly.
6. Reconnect power and test power supply with test button to be sure unit is operating properly.

IONIZING WIRE REPLACEMENT

The fine tungsten ionizing wires in the charging section of the electronic cell may break or become damaged. Inspect the cell from the upstream side after washing to make sure that none of the wires are broken or out of position. During operation, a broken or deformed wire generally causes a short to ground, possibly with visible arcing or sparking. This condition, or any other short in the ionizing section of the cell, will cause the indicator light to go out.

Broken wires must be replaced as soon as possible. Remove all parts of the broken wire. If necessary, the cell may be temporarily used with 1 wire missing. See PARTS LIST for part number of the replacement wire. Wires come cut to length with eyelets at each end for easy installation in the electronic cell.

1. Use care to avoid damage to the spring connector or other parts of the cell during the installation.
2. Hook one end of the ionizing wire over the spring connector at one end of the cell.
3. Hold the opposite eyelet with a needlenose pliers and stretch the wire the length of the cell. Depress the opposite spring connector and hook the eyelet over it.

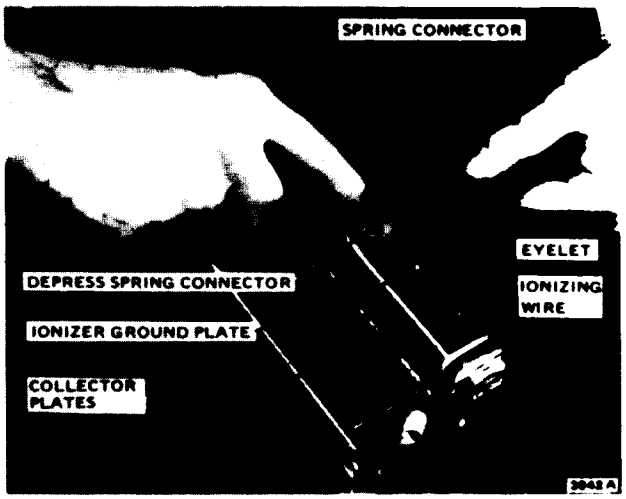


FIG. 8—INSTALLATION OF NEW IONIZING WIRES.

ARCING

From time to time you may hear a snapping noise coming from the electronic air cleaner. This arcing occurs when the air cleaner collects an unusually large particle, when cells are wet, extraordinarily dirty or damaged.

If an unusual amount of arcing persists, check first to determine if the electronic cells need washing. Look also for any sign of bent collector plates or broken ionizer wires.

If arcing still occurs when cell is clean and dry, consult your serviceman or dealer for repair.

MOTOR MAINTENANCE PROCEDURE

The manufacturer of the motor used in the C-12 recommends oiling of the motor at least once a year. The following procedure can be followed:

- De-energize the unit.
- Remove the pre-filters and cells from the cabinet.
- Remove the fan blade from the motor shaft.*
- Unscrew the four screws holding the motor mounting plate, and lower the motor. THE WIRING NEED NOT BE DISCONNECTED.
- There are two oil holes on the motor:
  1. Near the motor shaft.
  2. On the end opposite the motor shaft near the bearing plate.
- Five drops of SAE 20 weight non-detergent oil or electric motor oil in each hole is adequate.
- Wipe off excess oil which misses or runs out of oil holes.
- Replace motor fan blade, cells and pre-filters in the unit.
- Re-energize and check out to ensure proper operation.

*Fan blade need not be removed if serviceman has a hypodermic-type needle available for insertion of oil through oil hole plug. 1 cc is approximately five drops.

ELECTRICAL TROUBLESHOOTING

WARNING

The following instructions are intended for qualified service personnel only. Dangerous line voltage circuits are exposed during this procedure. Disconnect power before servicing unit.

TROUBLESHOOTING PROCEDURE

The following troubleshooting procedure has been designed to speed the serviceman's work and insure that any malfunction in the electronic air cleaner is quickly detected and properly repaired.

Most of the troubleshooting steps can be performed by observing the indicator light. This light is powered by the resonating winding on the high voltage transformer and is ON whenever the high voltage transformer is working properly.

This procedure is outlined in the flow chart below. A complete description is provided on the following pages.

The troubleshooting procedure description is divided into 2 sections:

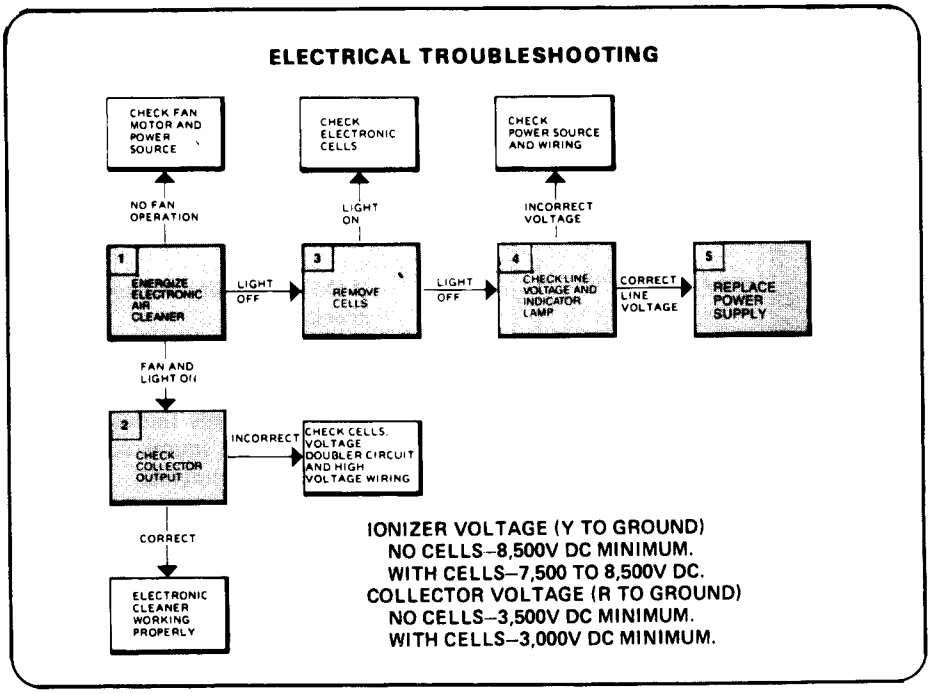
1. DIAGNOSTIC CHECKS–The numbered steps correspond to the numbered steps on the troubleshooting flow chart. Follow this sequence of checks to locate the cause of a failure within the air cleaner.

2. COMPONENT CHECKS–Explains how to locate a faulty component within an assembly, or how to prove a component good or bad.

TOOLS AND EQUIPMENT

Troubleshooting the C-12 can be accomplished with only a few tools.

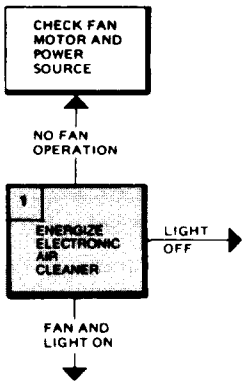
- Screwdrivers–long shank, plastic or rubber handles; 2 required for some arc checks.
- Needlenose pliers–for stringing ionizing wires.
- Test Meter–Honeywell W869 Electronic Air Cleaner Test Meter, or
- Simpson 260 with 25 kV dc probe.
- Soldering iron for replacing components.
- Neon test lamp for line voltage.
- A spare silicon diode.



DIAGNOSTIC CHECKS

DIAGNOSTIC CHECKS

1. ENERGIZE ELECTRONIC AIR CLEANER



a. Be sure that the electronic cells and prefilter screens are clean, dry, and properly installed in the air cleaner.

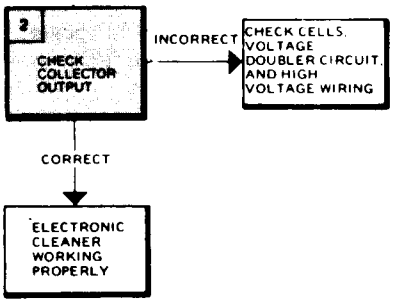
b. Energize the air cleaner and check for operation in all fan speeds. In each case the fan should run and the SYSTEM light should turn on.

–If the fan does not run, check the fan motor, power source, and interlock safety switch.

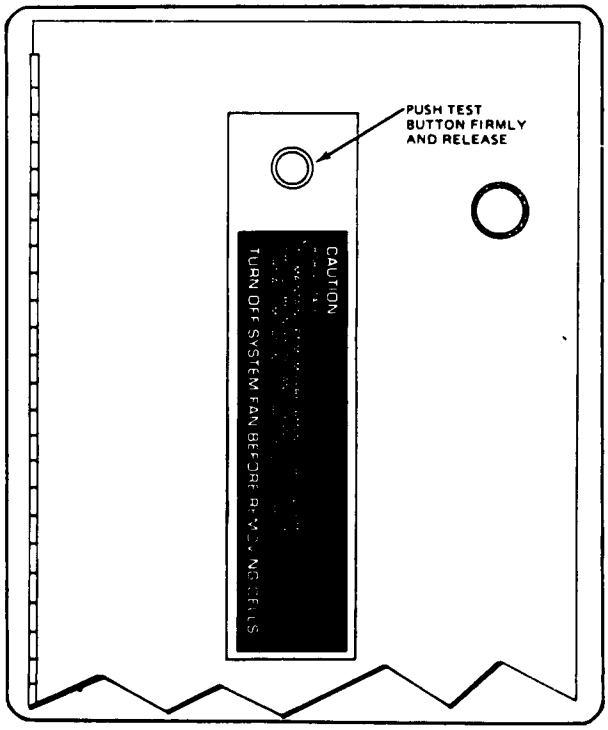
–If the SYSTEM light does not come on, go to step 3.

–If the fan runs and the SYSTEM light comes on, go to step 2.

2. CHECK COLLECTOR OUTPUT



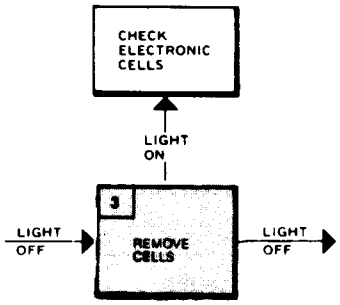
a. With air cleaner turned on, push TEST BUTTON to momentarily short out the collector section of the electronic cell.



b. Arcing indicates that the electronic air cleaner is working properly.

c. If no arcing noise is heard, check for continuity through the collector resistor, and then check for a failure in the electronic cells, voltage doubler circuit, or cell contact boards.

3. REMOVE CELLS



a. Turn off the air cleaner.

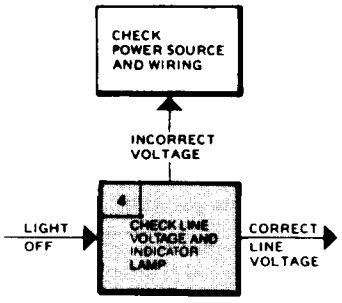
b. Open the access door by removing 2 thumbscrews holding door in place. Remove the electronic cells. Close the door.

c. Turn the air cleaner ON.

–If the light comes on now, check the electronic cells for a short circuit.

–If the light remains off, go to step 4.

4. CHECK POWER SUPPLY AND INDICATOR LAMP



a. Remove the 4 screws holding the control door in place and open the door.

b. Use a neon test light or a voltmeter to check line voltage on the primary of the high voltage transformer.

–If the correct line voltage is present, continue the checkout.

–If the correct line voltage is not measured on the primary of the high voltage transformer, check backwards through the switch and wiring to the power source until the problem can be located and corrected.

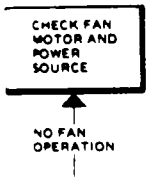
c. Check the voltage on the indicator light.

–If the voltage is correct (about 120V ac) and if the light is out, replace the assembly.

–If there is no voltage, or less than 100V ac, the power supply must be replaced. See page 11.

COMPONENT CHECKS

CHECK FAN MOTOR AND POWER SOURCE



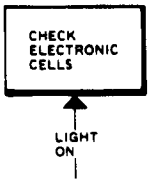
If the fan does not run when the switch is in HIGH, MEDIUM and LOW positions, check voltage supplied to the motor.

1. If the motor does not turn with the correct voltage applied, check to see that the shaft is free to turn. Replace the motor if necessary.

2. If the correct line voltage is not measured, check back through the wiring to the power source, including interlock safety switches.

CHECK ELECTRONIC CELLS

VISUAL INSPECTION



Carefully examine the electronic cells. Look especially for–

- –Bent collector plates.
- –Broken ionizing wires.
- –Dirt accumulation on insulators.
- –Contact tabs–ionizer and collector damage.

CHECK FOR SHORT CIRCUITS

Use an ohmmeter to check resistance between the outside frame of the cell and both the ionizer and collector contacts. In each case, the resistance should be infinite (open circuit).

FIG. 11–USE AN OHMMETER TO CHECK THE ELECTRONIC CELLS FOR SHORT CIRCUITS.

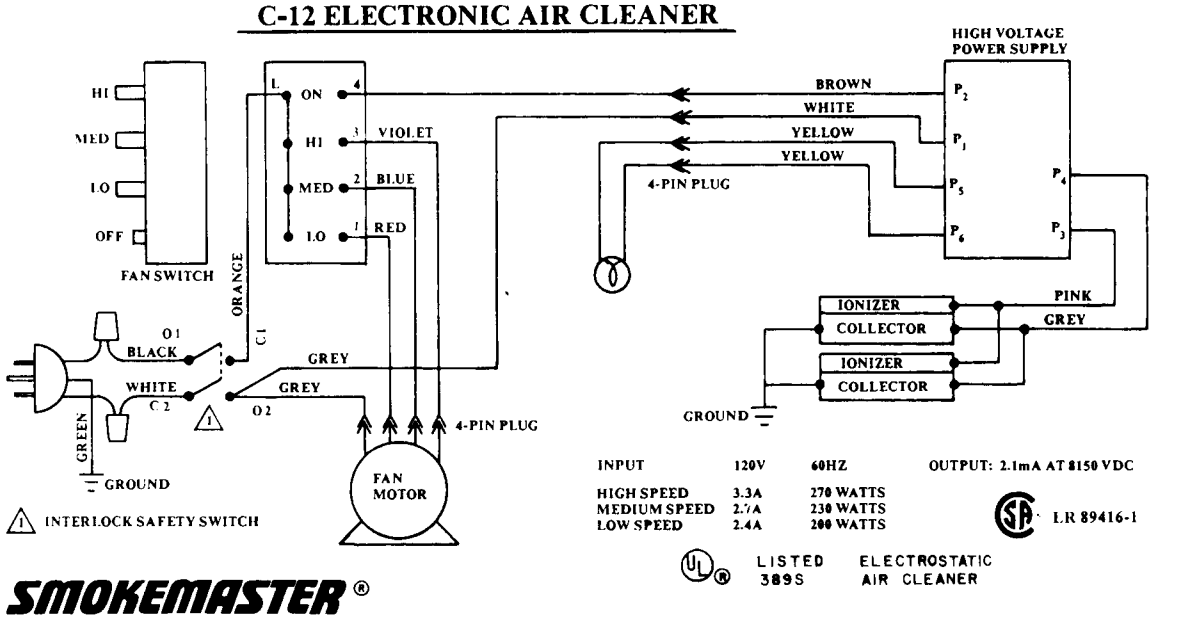
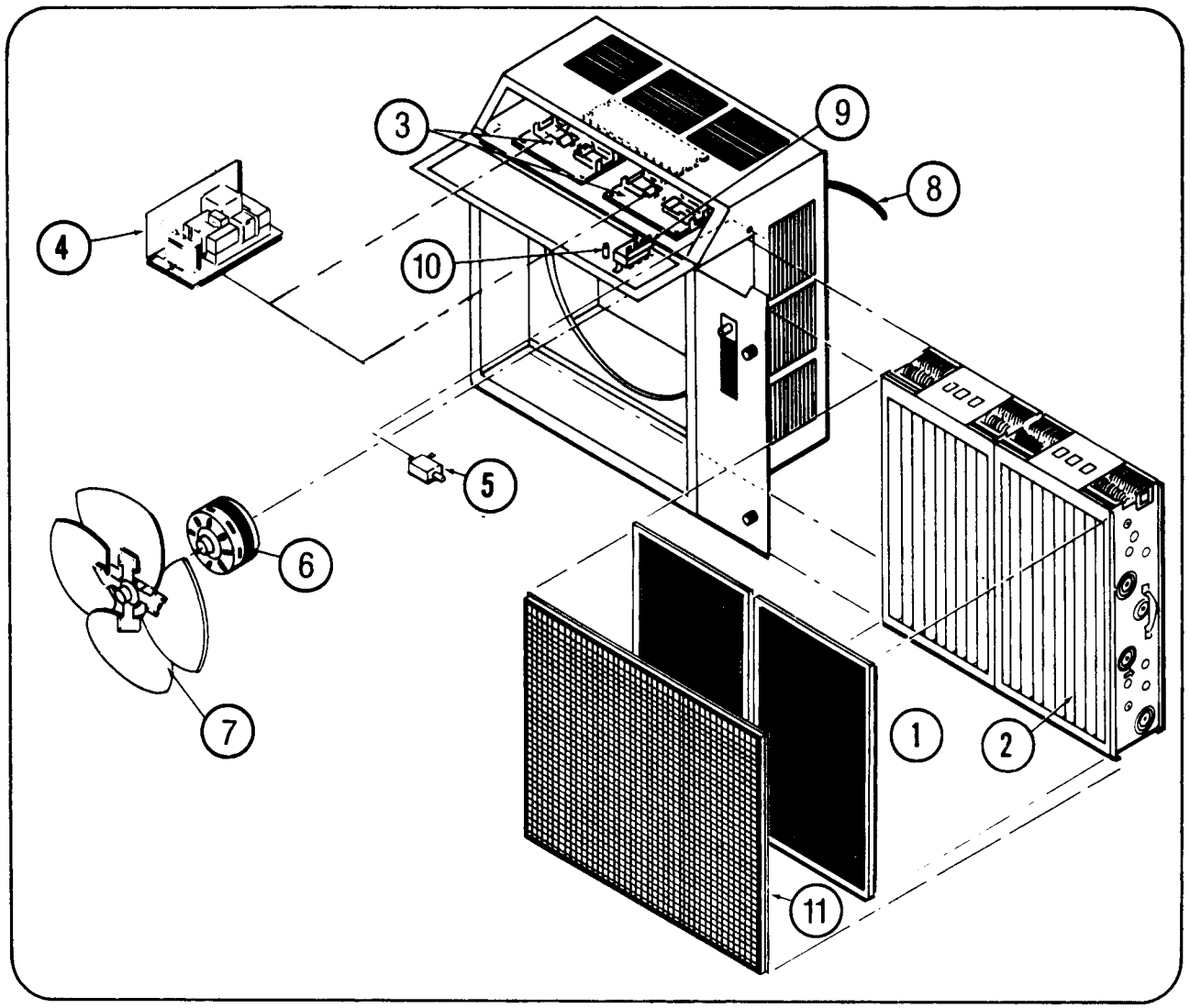


FIG. 12 INTERNAL SCHEMATIC DIAGRAM



NO.	DESCRIPTION	PART NUMBER	
		120V. 60 HZ MODELS	220/240V. 50 HZ MODELS
1.	Prefilter	41009 (2)	41009 (2)
2.	Electronic Cell	38001 (2)	38001 (2)
3.	Contact Board Assembly	46113 (2)	46113 (2)
4.	Power Supply	07071	07089
5.	Door Interlock Switch	10106	10106
6.	Motor	05013	05014
7.	Fan	37022	37022
8.	Power Cord	42078	42027
9.	Control Switch	10110	10110
10.	Indicator Light	10097	10097
11.	Intake Grille, Ivory	20025	20025
	Intake Grille, Black	20026	20026

TOLL FREE 1-800-328-0787

PARTS NOT ILLUSTRATED

Ionizing Wires (package of 5), Part No. 38004

GUIDE SPECIFICATIONS

MODEL C-12

Scope:

The following describes a self-contained, cord-connected, electronic air cleaning device to be suspended from the ceiling.

Description:

1. Unit shall operate from ordinary 120 volt, 60 Hz. power source, drawing no more than 3.3 amperes.

2. Unit shall be equipped with power cord and three prong plug and also equipped to be hard wired in installation if desired.

3. Provision for ground wire connection in field wiring compartment shall be made.

4. Fan motor shall be of shaded pole design and capable of running at three distinct speeds: hi, med and lo.

5. Air discharge shall be in four different directions.

6. Atmospheric dust spot efficiency shall be 89% minimum when tested according to ASHRAE Standard 52-76, and up to 93% efficient on lo speed.

7. Unit shall incorporate bell-mouthed fan orifice for purposes of quieter operation and greater throughput.

8. Built in interlock switch system shall disconnect power from all functions when access door is opened.

9. Airflow on Hi fan speed shall be a minimum of 1250 cfm.

10. Unit shall include metal mesh prefilters.

11. Unit shall have a test button and system light to indicate proper operation of high voltage power system.

12. Unit shall have voltage doubler system to provide over 8,000 volts to ionizer section and over 4,000 volts to collector section of cell.

13. Design of air cleaner shall limit production of noxious ozone to within OSHA approved levels.

14. High voltage power supply design shall limit short circuited output current to less than 5 mA.

15. Unit shall have a total electronic cell plate area of at least 105.8 square feet.

16. No tools shall be required to open or close cell access door.

17. Air cleaner shall mount to building supports on 16 inch centers and layout template shall be included to facilitate mounting.

18. Unit shall be listed by Underwriters Laboratories for use as an electrostatic air cleaner.

CERTIFICATE OF WARRANTY

LIMITED ONE YEAR SMOKEMASTER WARRANTY

Air Quality Engineering, Inc. warrants the Smokemaster Electronic Air Cleaners to be free from defects in workmanship or materials, under normal use and service, for a period of one (1) year from the date of purchase by the consumer. If, at any time during the warranty period, the product is defective or malfunctions, Air Quality Engineering, Inc. shall repair or replace it (at Air Quality Engineering's option) within a reasonable period of time.

If the product is defective,

(i) return unit or defective component with a bill of sale or other dated proof of purchase, to the retailer from which you purchased it, or

(ii) package unit or component, along with proof of purchase (including date purchased) and a short description of the malfunction, and mail or ship, postage or freight prepaid, to the following address:

AIR QUALITY ENGINEERING, INC. Customer Service 7140 Northland Drive North, Mnpls., MN 55428-1520

The repaired or replaced part or unit will be shipped by Air Quality Engineering, Inc. to the purchaser, freight collect, with the purchaser to be responsible for all freight charges. The warranty on any repaired or replacement part shall be for a duration of time no longer than the remaining or unexpired term of the original warranty. This warranty does not cover any labor or other service charges incurred by the purchaser.

This warranty shall not apply if it is shown by Air Quality Engineering that the defect or malfunction was caused by damage which occurred while product was in the possession of a consumer.

Air Quality Engineering's sole responsibility shall be to repair or replace the product within the terms stated above. AIR QUALITY ENGINEERING SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF WARRANTY, EXPRESS OR IMPLIED, APPLICABLE TO THIS PRODUCT. Some states do not allow the exclusion or limitation of consequential damages, so this limitation may not apply to you.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND THE WARRANTIES OF MERCHANTIBILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY EXCLUDED BEYOND THE ONE YEAR DURATION OF THIS WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

SMOKEMASTER®

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